IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Diane Elsie Hall	)	
		)	Confirmation No. 1916
		)	
Application No.: 10/535,076		)	Group Art Unit 1797
		)	
Filed:	May 13, 2005	)	Examiner: James C. Goloboy
		)	
Title:	Method of Reducing Particulate Emissions	)	Atty. Docket No.:BP9861
		)	

RESPONSE

Mail Stop Amendment – via EFS
Commissioner for Patents
Alexandria, Virginia 22313-1450

Dear Commissioner:

This is in response to the Office Action dated April 1, 2008. The shortened statutory period for response is three months from the mailing date, *i.e.*, by July 1, 2008. Applicants are concurrently filing a Request for A Three-Month Extension of Time, extending the deadline for response to October 1, 2008, and thus, this response is timely. The Request and the required fee accompany this paper. Please enter the following amendments and remarks into the record for this application.

A **Listing of Claims** begins on page 2 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Listing of Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Claims 1-15 (Canceled)

16. (Presently Amended) A method of reducing the number of nucleation mode particles in the emissions from a diesel engine fitted with a catalyzed particular trap which is a continuously regenerating trap (CRT™) comprising both an oxidation catalyzed and a particulate trap, which method comprises using an engine lubricating oil having a low sulphur content of less than 0.4% by weight in combination with a fuel having a low sulphur content of below 50 ppm by weight to reduce the emissions of nucleation mode particles from the diesel engine fitted with a particular trap.

17. (Canceled)

18. (Canceled)

19. (Presently Amended) A method according to claim ~~18,~~ 16, wherein the diesel engine is a heavy duty diesel engine.

20. (Presently Amended) A method according to claim ~~1~~ 16, wherein the diesel engine is heavy duty diesel engine.

21. (Presently Amended) A method according to claim ~~1~~ 16, wherein nucleation mode particles have a diameter of 30 nm or less.

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Original) A method according to claim 21, wherein the sulphur content (by weight) of the fuel is below 20ppm.

26. (Original) A method according to claim 21, wherein the sulphur content (by weight) of the fuel is 10ppm or lower.

27. (Original) A method according to claim 26, wherein the lube oil has a sulphur content (by weight) of less than 015%.

28. (Presently Amended) A method according to claim 27, wherein the lubricating oil comprises one or more anti-wear additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of (a) molybdenum containing compounds, ~~such as molybdenum dithiophosphate (MoDTC), molybdenum dithiophosphate and molybdenum amines,~~ (b) organic based friction modifiers, ~~such as oleamides, acids, amines, alcohols, phosphate esters and glycerol monooleates~~ and (c) salicylate-type detergents ~~such as calcium salicylate and magnesium salicylate~~.

29. (Presently Amended) A method according to claim 27, wherein the lubricating oil comprises one or more anti-oxidant additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of aromatic amines ~~or~~ and phenolic compounds ~~such as hindered phenolics~~.

30. (Presently Amended) A method according to claim 27, wherein the lubricating oil comprises one or more corrosion inhibitor additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the non-sulphur detergent additivies.

31. (Original) A method according to claim 27, wherein the lubricating oil comprises one or more other additives selected from one or more of anti-foam additives, Viscosity Index improvers and dispersants.

32. (Original) A method according to claim 21, wherein the low sulphur lube oil has sulphur content (by weight) of less than 0.4%.

33. (Original) A method according to claim 21, wherein the low sulphur lube oil has a sulphur content (by weight) of less than 0.3%.

34. (Original) A method according to claim 21, wherein the lube oil has a sulphur content (by weight) of less than 0.2%.

35. (Original) A method according to claim 21, wherein the lube oil has a sulphur content (by weight) of less than 0.15%.

36. (Presently Amended) A method according to claim 21, wherein the lubricating oil comprises one or more anti-wear additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of (a) molybdenum containing compounds, ~~such as molybdenum dithiophosphate (MoDTC), molybdenum dithiophosphate and molybdenum amines,~~ (b) organic based friction modifiers, ~~such as oleamides, acids, amines, alcohols, phosphate esters and glycerol monooleates~~ and (c) salicylate-type detergents ~~such as calcium salicylate and magnesium salicylate~~.

37. (Presently Amended) A method according to claim 21, wherein the lubricating oil comprises one or more anti-oxidant additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of aromatic amines ~~or~~ and phenolic compounds such as hindered phenolics.

38. (Presently Amended) A method according to claim 21, wherein the lubricating oil comprises one or more corrosion inhibitor additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the non-sulphur detergent additivies.

39. (Original) A method according to claim 21, wherein the lubricating oil comprises one or more other additives selected from one or more of anti-foam additives, Visocity Index improvers and dispersants.

40. (Original) A method according to claim 16, wherein the nucleation mode particles have a diameter in the range of from 1 nm to 30 nm inclusive.

41. (Original) A method according to claim 16, wherein the nucleation mode particles have a diameter in the range of from greater than 3 nm to 30 nm inclusive.

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (Original) A method according to claim 16, wherein the sulphur content (by weight) of the fuel is below 20ppm.

46. (Original) A method according to claim 16, wherein the sulphur content (by weight) of the fuel is 10ppm or lower.

47. (Original) A method according to claim 46, wherein the lube oil has a sulphur content (by weight) of less than 0.15%.

48. (Canceled)

49. (Original) A method according to claim 16, wherein the low sulphur lube oil has a sulphur content (by weight) of less than 0.3%.

50. (Original) A method according to claim 16, wherein the lube oil has a sulphur content (by weight) of less than 0.2%.

51. (Original) A method according to claim 16, wherein the lube oil has a sulphur content (by weight) of less than 0.15%.

52. (Original) A method of according to claim 16, wherein the lubricating oil has a ZDDP content at most 0.8% by weight.

53. (Original) A method of according to claim 16, wherein the lubricating oil has a ZDDP contained at most 0.4% by weight.

54. (Original) A method of according to claim 16, wherein the lubricating oil is substantially free of ZDDP.

55. (Presently Amended) A method according to claim 16, wherein the lubricating oil comprises one or more anti-wear additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of (a) molybdenum containing compounds, ~~such as molybdenum dithiophosphate (MoDTC), molybdenum dithiophosphate and molybdenum amines,~~ (b) organic based friction modifiers~~, such as oleamides, acids, amines, alcohols, phosphate esters and glycerol monooleates~~ and (c) salicylate-type detergents ~~such as calcium salicylate and magnesium salicylate~~.

56. (Presently Amended) A method according to claim 16, wherein the lubricating oil comprises one or more anti-oxidant additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the group consisting of aromatic amines ~~or~~ and phenolic compounds~~ such as hindered phenolics~~.

57. (Presently Amended) A method according to claim 16, wherein the lubricating oil comprises one or more corrosion inhibitor additives ~~which might be used, at least in part, to replace ZDDP,~~ selected from the non-sulphur detergent additivies.

58. (Original) A method according to claim 16, wherein the lubricating oil comprises one or more other additives selected from one or more of anti-foam additives, Viscosity Index improvers and dispersants.

REMARKS/ARGUMENTS

Claims 16, 19-21, 25-41, 45-47, and 49-58 remain in the application for further prosecution. Claims 16, 19-21, 28-30, 36-38, and 55-57 have been amended. Claims 17, 18, 22-24, 42-44, and 48 have been canceled in this amendment.

Incorrect Claim Dependencies

The Examiner objected to the dependencies of claims 20 and 21, since they depend on claim 1 which has been cancelled.

This objection has been overcome by the above-described correction.

35 USC § 112

The Examiner objected of the use of the phrase "such as..." in claims 28 - 30, 36-38 and 55-57 as being indefinite. The Examiner further objects to the phrase "additives which might be used, at least in part, to replace ZDDP".

These objections have been rendered moot by the above-described amendments.

35 USC § 102

The Examiner believes that the present invention is anticipated by US 6588393 (Chamberlin). We respectfully disagree.

Claim 16 of the present invention requires the use of a lubricating oil having a sulphur content of less than 0.4% by weight combined with a fuel having a sulphur content of less than 50 ppm in a diesel engine which is fitted with a particulate trap which is a catalyzed particulate trap comprising both an oxidation catalyst and a filter.

Chamberlin relates to a low-sulphur lubricating oil composition, having a sulphur content of about 5 to about 250 ppm, and a method of operating an internal combustion engine equipped with an exhaust gas after treatment device. The internal combustion engine may be a diesel engine, the exhaust gas after treatment devices are said to include

catalytic converters, particulate traps, catalyzed traps and the like. It is stated that the diesel fuel may have a sulfur content of up to 0.05% by weight (500 ppm).

However, there is no explicit disclosure anywhere in Chamberlin of a fuel having a sulphur content of less than 50 ppm. Furthermore, Chamberlin does not disclose the use of a continuously regenerating particulate trap as is claimed in the present application.

Thus, Chamberlin does not disclose the use of a lubricating oil having a sulphur content of less than 0.4% by weight in combination with a fuel having a sulphur content of less than 50 ppm in a diesel engine which is fitted with a catalyzed particulate trap which is a continuously regenerating trap comprising both an oxidation catalyst and a filter.

Thus, claim 16 is novel over Chamberlin. Further, since claim 16 is novel, all of the dependent claims must also be novel.

35 USC § 103

We further submit that claim 16 of the present application is non-obvious in view of Chamberlin for the following reasons.

The problem addressed by the present invention is that of the need to reduce the number of nucleation mode particles emitted from diesel engines fitted with particulate traps.

As explained in the present application (see for example page 1, line 21 to page 2, line 14), nucleation mode particles make up a relatively low *mass* of particulate emissions from such engines. However, it has been found that these nucleation mode particles can make a significant contribution to the total *number* of particulates emitted.

It is desirable to reduce the number of nucleation particles emitted and the present invention provides a solution to this technical problem by the combination of the features claimed.

It has been found that use of a low sulphur lube oil with a low sulphur fuel according to the present invention causes significantly reduced nucleation mode particulate emissions compared to use of a conventional lube oil with a low sulphur fuel.

Surprisingly, the reduction in nucleation mode particulate emissions is significantly larger than might be expected based on the reduction in sulphur level of the lube oil alone.

Chamberlin, however, is wholly concerned with the problems of:

- protecting after-exhaust gas treatment devices from harmful exposure to metal and phosphorous containing extreme pressure agents and their decomposition products;
- extending oil change intervals; and
- reducing the levels of NO_x in exhaust gases [col. 1, lines 19-54].

Chamberlin makes no reference to the presence of nucleation mode particles in particulate emissions. Thus, the skilled person would not be motivated to consult Chamberlin when looking to solve the above-described problem.

Further, although at col. 16, lines 40 to 44 the sulphur level of the diesel fuel may be up to about 0.05 % by weight (low-sulphur diesel fuel), it is also stated at col. 16, lines 33 that "The diesel fuel that is useful may be any diesel fuel". Thus, Chamberlin is not teaching towards the combined use of a diesel fuel with a sulphur content of less than 50 ppm with a lube with a sulphur content of less than 0.4 % in a diesel engine as defined in the present application. The Examiner's objection is based on hindsight.

Thus, claim 16 is non-obvious in view of Chamberlin. Further, since claim 16 is non-obvious, all of the dependent claims must also be non-obvious.

Papay (US 5,652,201) – since claim 16 is non-obvious, dependant claims 28, 36 and 55 are also non-obvious. Furthermore, Papay does not disclose the use of the combination of the low sulphur fuel and lube as defined in the present application in a diesel engine as defined in the present application.

Alcorn (US 4,869,738) – the objection against dependent claims 17 and 18 is rendered moot in view of their deletion and incorporation into claim 16 which for the reasons above at least, is non-obvious. Furthermore, Alcorn does not disclose the use of the combination of the low sulphur fuel and lube as defined in the present application.

Cooper (US 4,902,487) in the light of evidence provided by Twigg (US 6,294,141) Furthermore, Cooper and Twigg are silent about nucleating mode particles

and do not disclose the use of the combination of low sulphur fuel and lube as defined in the present application.

Supplemental Information Disclosure Statement.

We have previously submitted an Information Disclosure Statement for the oppositions against the corresponding European patent. A translation of the opposition by MAN is now available.

We have also had selected parts (pages 1 – 22, 55 – 61 and 97 – 100) of D2 cited by this Opponent translated.

Conclusion

It is the Applicant's belief that all of the claims are now in condition for allowance and action towards that effect is respectfully requested.

As mentioned above, a Petition for Extension of Time is hereby made, requesting a three-month extension of time from July 1, 2008 to October 1, 2008. Please charge the corresponding $1,050.00 three-month extension fee to BP America, Inc. Deposit Account No. 01-0528, Order No. BP-09861. It is believed that no other fees are due; however, should any additional fees be required (except for payment of the issue fee), the Commissioner is authorized to deduct or credit any overpayment.

Respectfully submitted,

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